

What is claimed is:

- 1 1. An apparatus, comprising:
2 a voltage source to provide a substantially temperature stable output voltage;
3 a first semiconductor device biased by the substantially temperature stable
4 output voltage to provide a first output current; and
5 a second semiconductor device biased by the substantially temperature
6 stable output voltage to provide a second output current, the second semiconductor
7 device to couple to the first semiconductor device to provide a reference current
8 approximately equal to a difference between the first and the second output currents.
- 1 2. The apparatus of claim 1, wherein the first and the second semiconductor
2 devices are biased by the substantially temperature stable output voltage to operate
3 in a saturation mode.
- 1 3. The apparatus of claim 1, wherein the first and the second semiconductor
2 devices are fabricated on a single die.
- 1 4. The apparatus of claim 1, further including:
2 a differencing circuit to couple to the first and the second semiconductor
3 devices.
- 1 5. The apparatus of claim 1, further including:
2 a pair of current mirrors to couple to the first and the second semiconductor
3 devices.
- 1 6. The apparatus of claim 5, wherein the first and the second semiconductor
2 devices and the pair of current mirrors are fabricated on a single die.

1 7. The apparatus of claim 1, wherein a reference magnitude of the reference
2 current is approximately equal to a difference between the second output current and
3 a product of the first output current and a scaling constant.

1 8. The apparatus of claim 7, further comprising:
2 a differencing circuit including a first current mirror selected to determine
3 the scaling constant.

1 9. The integrated circuit of claim 9, wherein the voltage source comprises a
2 band-gap voltage source.

1 10. An integrated circuit, comprising:
2 a voltage source to provide a substantially temperature stable output voltage;
3 a first semiconductor device biased by the substantially temperature stable
4 output voltage to provide a first output current; and
5 a second semiconductor device biased by the substantially temperature
6 stable output voltage to provide a second output current, the second semiconductor
7 device to couple to the first semiconductor device to provide a reference current
8 approximately equal to a difference between the first and the second output currents;
9 and
10 an output node in electrical communication with the first and second
11 semiconductor devices to carry the reference current.

1 11. The integrated circuit of claim 10, wherein the first and the second
2 semiconductor devices are biased by the substantially temperature stable output
3 voltage to operate in a saturation mode.

1 12. The integrated circuit of claim 10, further including:
2 a differencing circuit to couple to the first and the second semiconductor
3 devices.

- 1 13. The integrated circuit of claim 12, wherein the reference current has a
2 reference magnitude approximately equal to the difference between the second
3 output current and a product of the first output current and a scaling constant
4 determined by a current mirror included in the differencing circuit.
- 1 14. The integrated circuit of claim 10, wherein each one of the first and the
2 second semiconductor devices comprise a field effect transistor.
- 1 15. The integrated circuit of claim 14, further including:
2 a pair of current mirrors to couple to the first and the second semiconductor
3 devices, wherein each one of the pair of current mirrors includes a pair of field
4 effect transistors, and wherein the first and the second semiconductor devices and
5 the pair of current mirrors are fabricated on a single die.
- 1 16. The integrated circuit of claim 10, wherein the voltage source comprises a
2 band-gap voltage source.
- 1 17. A system, comprising:
2 a cellular telephone including a voltage source to provide a substantially
3 temperature stable output voltage, a first semiconductor device biased by the
4 substantially temperature stable output voltage to provide a first output current, and
5 a second semiconductor device biased by the substantially temperature stable output
6 voltage to provide a second output current, the second semiconductor device to
7 couple to the first semiconductor device to provide a reference current
8 approximately equal to a difference between the first and the second output currents.
- 1 18. The system of claim 17, further comprising a differencing circuit to couple
2 to the first and the second semiconductor devices.
- 1 19. The system of claim 18, wherein the differencing circuit includes a first
2 current mirror selected to determine a scaling constant.

- 1 20. The system of claim 19, wherein the reference current has a reference
- 2 magnitude approximately equal to the difference between the second output current
- 3 and a product of the first output current and the scaling constant.